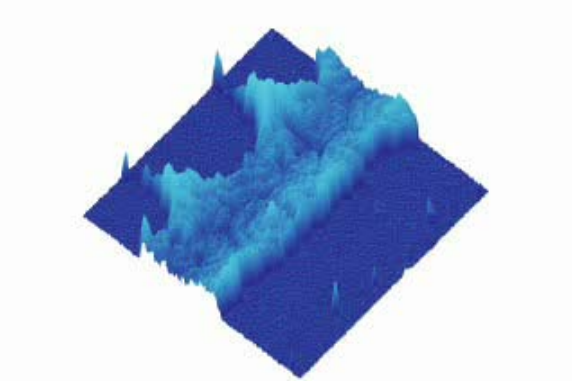
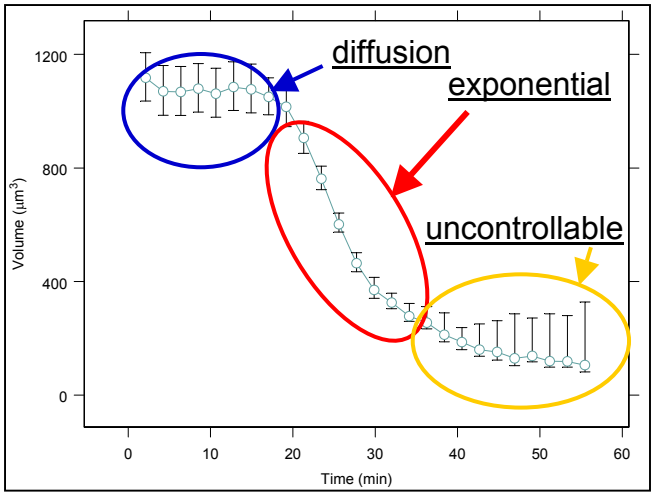
REU Site: A Materials Science REU Site at James Madison University

Chris Hughes, James Madison University, DMR-**0097449**

The biodegradable polymers poly-3-hydroxyvalerate [P(3HV)] and poly-3-hydroxybutyrate [P(3HB)] have been patterned on gold surfaces using soft lithographic techniques and then imaged using atomic force microscopy during the degradation process. Numerical methods have been developed to quantify the volume of material as a function of time and explore reaction kinetics.



AFM image of a partially degraded P(3HB) feature on a gold surface.



Plot of the volume of biodegradable polymer as a function of time showing three distinct regimes during the degradation process.

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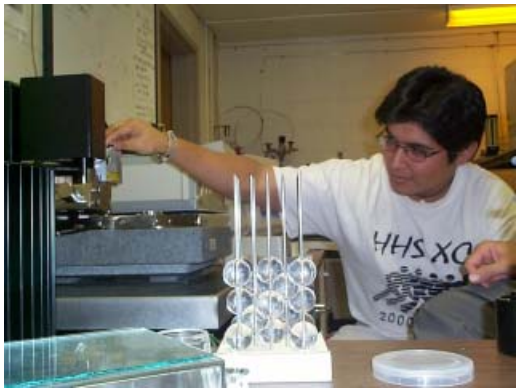
Exposing Undergraduates to High Level Research

Students in this REU program have worked on equipment ranging from state-of-the-art scanning electron microscopy to nanoscale scanning probe microscopy. Not only do these undergraduates learn these advanced techniques, they do so in an environment that puts them in contact with scientists at other institutions and local industry.



REU student Renzo Olguin works on the atomic force microscope.

REU students Stacey DiPalma (left) and Olivia Lees (right) cleaving semiconductor wafers in the lab.

REU student Robbie Phelps (right) discusses the poster presentation of his research with JMU President Linwood Rose.